CLAIMS:

1. A producing process of a sterile plant, comprising causing a plant to produce a chimeric protein, in which a transcription factor that promotes expression of a gene associated with formation of floral organs is fused with a functional peptide that converts an arbitrary transcription factor into a transcription repressor, so as to sterilize the plant.

2. A producing process of a sterile plant, comprising causing a plant to produce a chimeric protein, in which a transcription factor that promotes expression of a gene associated with formation of floral organs is fused with a functional peptide that converts an arbitrary transcription factor into a transcription repressor, so as to suppress expression of the gene associated with formation of floral organs.

3. A producing process of a sterile plant as set forth in claim 1, wherein the transcription factor that promotes expression of a gene associated with formation of floral organs is a transcription factor associated with formation of stamen or pistil.

4. A producing process of a sterile plant as set forth in any one of claims 1 through 3, wherein at least formation of stamen is suppressed in the sterile plant.

5. A producing process of a sterile plant as set forth in claim 3, wherein the transcription factor associated with formation of stamen or pistil is a transcription factor that promotes transcription of a gene associated with dehiscence of anther, and wherein a chimeric protein in which the

transcription factor is fused with a functional peptide that converts an arbitrary transcription factor into a transcription repressor is produced in a plant so as to suppress dehiscence of anther.

6. A producing process of a sterile plant as set forth in claim 5, wherein the transcription factor that promotes transcription of a gene associated with dehiscence of anther is a transcription factor with an MYB domain, and wherein a chimeric protein in which the transcription factor is fused with a functional peptide that converts an arbitrary transcription factor into a transcription repressor is produced in a plant so as to suppress transcription of the gene associated with dehiscence of anther.

7. A producing process of a sterile plant as set forth in claim 5 or 6, wherein the plant has sterile female organs.

8. A producing process of a sterile plant as set forth in any one of claims 5 through 7, wherein the plant produces sterile pollens.

9. A producing process of a sterile plant, comprising causing a plant to produce a chimeric protein, in which a transcription factor associated with formation of stamen and pistil is fused with a functional peptide that converts an arbitrary transcription factor into a transcription repressor, so as to produce a double-flowered plant.

10. A producing process of a sterile plant as set forth in any one of claims 1 through 4, comprising a transforming step of introducing into plant cells a recombinant expression vector

that includes a chimeric gene containing (i) a coding gene of the transcription factor and (ii) a polynucleotide that encodes the functional peptide.

11. A producing process of a sterile plant as set forth in claim 10, further comprising an expression vector constructing step of constructing the recombinant expression vector.

12. A producing process of a sterile plant as set forth in any one of claims 1, 3, and 5 through 8, comprising a transforming step of introducing into plant cells a recombinant expression vector that includes a chimeric gene containing (i) a coding gene of the transcription factor and (ii) a polynucleotide that encodes the functional peptide.

13. A producing process of a sterile plant as set forth in claim 12, further comprising an expression vector constructing step of constructing the recombinant expression vector.

14. A producing process of a sterile plant as set forth in any one of claims 1, 3, and 9, comprising a transforming step of introducing into plant cells a recombinant expression vector that includes a chimeric gene containing (i) a coding gene of the transcription factor and (ii) a polynucleotide that encodes the functional peptide.

15. A producing process of a sterile plant as set forth in claim 14, further comprising an expression vector constructing step of constructing the recombinant expression vector.

16. A producing process of a sterile plant as set forth in any one of claims 1 through 4, 10, and 11, wherein the

transcription factor is:

(e) a protein with an amino acid sequence represented by SEQ ID NO: 134, or

(f) a protein with the substitution, deletion, insertion, and/or addition of one to several amino acids in the amino acid sequence represented by SEQ ID NO: 134, and capable of promoting expression of the gene associated with formation of floral organs.

17. A producing process of a sterile plant as set forth in claim 10 or 11, wherein the coding gene of the transcription factor is:

(e) a gene that has a base sequence of SEQ ID NO: 135 as an open reading frame; or

(f) a gene that hybridizes under stringent conditions with a gene of a base sequence complementary to the gene of the base sequence represented by SEQ ID NO: 135, and that encodes the transcription factor that promotes expression of the gene associated with formation of floral organs.

18. A producing process of a sterile plant as set forth in any one of claims 1, 3, 5, 7, 8, 12, and 13, wherein the transcription factor is:

(a) a protein with an amino acid sequence represented by SEQ ID NO: 136; or

(b) a protein with the substitution, deletion, insertion, and/or addition of one to several amino acids in the amino acid sequence represented by SEQ ID NO: 136, and capable of promoting transcription of a gene associated with dehiscence of anther.

19. A producing process of a sterile plant as set forth in any one of claims 1, 3, 5, 7, 8, 12, and 13, wherein the transcription factor shares 50% or greater homology with the amino acid sequence of SEQ ID NO: 136, and is a protein capable of promoting transcription of a gene associated with dehiscence of anther.

20. A producing process of a sterile plant as set forth in claim 12 or 13, wherein the coding gene of the transcription factor is:

(c) a gene that has a base sequence of SEQ ID NO: 137 as an open reading frame; or

(d) a gene that hybridizes under stringent conditions with a gene of a base sequence complementary to the gene of the base sequence represented by SEQ ID NO: 137, and that encodes a transcription factor that promotes transcription of a gene associated with dehiscence of anther.

21. A producing process of a sterile plant as set forth in any one of claims 1, 3, 6 through 8, 12, and 13, wherein the transcription factor is:

(a) a protein with an amino acid sequence represented by SEQ ID NO: 138; or

(b) a protein with the substitution, deletion, insertion, and/or addition of one to several amino acids in the amino acid sequence represented by SEQ ID NO: 138, and capable to promoting transcription of a gene associated with dehiscence of anther.

22. A producing process of a sterile plant as set forth in claim 12 or 13, wherein the coding gene of the protein is:

(c) a gene that has a base sequence of SEQ ID NO: 139 as an open reading frame; or

(d) a gene that hybridizes under stringent conditions with a gene of a base sequence complementary to the gene of the base sequence represented by SEQ ID NO: 139, and that encodes a transcription factor that promotes transcription of a gene associated with dehiscence of anther.

23. A producing process of a sterile plant as set forth in any one of claims 1, 3, 9, 14 and 15, wherein the transcription factor is:

(a) a protein with an amino acid sequence represented by SEQ ID NO: 140; or

(b) a protein with the substitution, deletion, insertion, and/or addition of one to several amino acids in the amino acid sequence represented by SEQ ID NO: 140.

24. A producing process of a sterile plant as set forth in claim 14 or 15, wherein the coding gene of the transcription factor is:

(c) a gene that has a base sequence of SEQ ID NO: 141 as an open reading frame; or

(d) a gene that hybridizes under stringent conditions with a gene of a base sequence complementary to the gene of the base sequence represented by SEQ ID NO: 141, and that encodes a protein associated with

formation of stamen and pistil.

25. A producing process of a sterile plant,

said process using a gene that encodes:

(a) a protein with an amino acid sequence represented by SEQ ID NO: 136; or

(b) a protein with the substitution, deletion, insertion, and/or addition of one to several amino acids in the amino acid sequence represented by SEQ ID NO: 136, and capable to promoting transcription of a gene associated with dehiscence of anther, or

said process using:

(c) a gene that has a base sequence of SEQ ID NO: 137 as an open reading frame; or

(d) a gene that hybridizes under stringent conditions with a gene of a base sequence complementary to the gene of the base sequence represented by SEQ ID NO: 137.

26. A producing process of a sterile plant as set forth in any one of claims 1 through 25, wherein the functional peptide has an amino acid sequence represented by one of:

(1) X1-Leu-Asp-Leu-X2-Leu-X3, where X1 represents 0 to 10 amino acid residues, X2 represents Asn or Glu, and X3 represents at least 6 amino acid residues;

(2) Y1-Phe-Asp-Leu-Asn-Y2-Y3, where Y1 represents 0 to 10 amino acid residues, Y2 represents Phe or Ile, and Y3 represents at least 6 amino acid residues;

(3) Z1-Asp-Leu-Z2-Leu-Arg-Leu-Z3, where Z1

represents Leu, Asp-Leu, or Leu-Asp-Leu, Z2 represents Glu, Gln, or Asp, and Z3 represents 0 to 10 amino acid residues; and

(4) Asp-Leu-Z4-Leu-Arg-Leu, where Z4 is Glu, Gln, or Asp.

27. A producing process of a sterile plant as set forth in any one of claims 1 through 25, wherein the functional peptide has an amino acid sequence represented by any one of SEQ ID NO: 1 though 17.

28. A producing process of a sterile plant, wherein the functional peptide is:

(e) a peptide with an amino acid sequence represented by SEQ ID NO: 18 or 19; or

(f) a peptide with the substitution, deletion, insertion, and/or addition of one to several amino acids in the amino acid sequence represented by SEQ ID NO: 18 or 19.

29. A producing process of a sterile plant as set forth in any one of claim 1 through 25, wherein the functional peptide has an amino acid sequence represented by:

α1-Leu-β1-Leu-γ1-Leu ... (5)

where α1 is Asp, Asn, Glu, Gln, Thr, or Ser, β1 is Asp, Gln, Asn, Arg, Glu, Thr, Ser, or His, and γ1 is Arg, Gln, Asn, Thr, Ser, His, Lys, or Asp.

30. A producing process of a sterile plant as set forth in any one of claim 1 through 25, wherein the functional peptide has an amino acid sequence represented by:

α1-Leu-β1-Leu-γ2-Leu ... (6)

α1-Leu-β2-Leu-Arg-Leu ... (7)

α2-Leu-β1-Leu-Arg-Leu ... (8)

where α1 is Asp, Asn, Glu, Gln, Thr, or Ser, α2 is Asn, Glu, Gln, Thr, or Ser, β1 is Asp, Gln, Asn, Arg, Glu, Thr, Ser, or His, β2 is Asn, Arg, Thr, Ser, or His, and γ2 is Gln, Asn, Thr, Ser, His, Lys, or Asp.

31. A producing process of a sterile plant as set forth in any one of claims 1 through 25, wherein the functional peptide is a peptide with an amino acid sequence represented by SEQ ID NO: 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 38, 39, 40, or 152.

32. A producing process of a sterile plant as set forth in any one of claims 1 through 25, wherein the functional peptide is a peptide with an amino acid sequence represented by SEQ ID NO: 36 or 37.

33. A sterile plant, which is produced by the producing process of any one of claims 1 through 32.

34. A sterile plant as set forth in claim 33, wherein the sterile plant includes at least one of: an adult plant; a plant cell; a plant tissue; a callus; and a seed.

35. A sterile plant producing kit for performing the producing process of any one of claims 1 through 32, said kit comprising a recombinant expression vector that includes:

a gene that encodes a transcription factor that promotes expression of a gene associated with formation of floral organs, formation of stamen or pistil, dehiscence of anther, or formation of stamen and pistil;

a polynucleotide that encodes a functional peptide that converts an arbitrary transcription factor into a transcription repressor; and

a promoter.

36. A sterile plant producing kit as set forth in claim 35, further comprising chemicals for introducing the recombinant expression vector into plant cells.

CLAIMS:

1. (Amended) A producing process of a sterile plant, comprising causing a plant to produce a chimeric protein, in which a transcription factor that promotes expression of a gene associated with formation of floral organs is fused with a functional peptide that converts an arbitrary transcription factor into a transcription repressor, so that the chimeric protein suppresses transcription of the gene associated with formation of floral organs and thereby sterilize the plant.

2. (Amended) A producing process of a sterile plant, comprising causing a plant to produce a chimeric protein, in which a transcription factor that promotes expression of a gene associated with formation of floral organs is fused with a functional peptide that converts an arbitrary transcription factor into a transcription repressor, so that the chimeric protein suppresses transcription of the gene associated with formation of floral organs and thereby changes flower morphology.

3. A producing process of a sterile plant as set forth in claim 1, wherein the transcription factor that promotes expression of a gene associated with formation of floral organs is a transcription factor associated with formation of stamen or pistil.

4. A producing process of a sterile plant as set forth in any one of claims 1 through 3, wherein at least formation of stamen is suppressed in the sterile plant.

5. A producing process of a sterile plant as set forth in claim 3, wherein the transcription factor associated with

formation of stamen or pistil is a transcription factor that promotes transcription of a gene associated with dehiscence of anther, and wherein a chimeric protein in which the